

REMARKS

Claims 1-50 are now in this application. Claims 1-44 are rejected. Claims 1-7, 23 and 25 are amended herein to clarify the invention, to broaden language as deemed appropriate and to address matters of form unrelated to substantive patentability issues. New claims 45-50 are added.

Applicant herein traverses and respectfully requests reconsideration of the rejection of the claims cited in the above-referenced Office Action.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) for allegedly lacking identification of the reference numeral 14 mentioned in the description. Applicant respectfully traverses this objection. It is noted by applicant that Fig. 1 does, in fact, already include the reference designator 14, which is located just to the left of designators 11 and 12, near the middle of the drawing. Therefore, withdrawal of the objection is earnestly requested.

The Office Action states that the specification is objected to for various informalities, including inconsistent or duplicative use of reference designators. Applicant submits herewith a substitute specification wherein amendments are effected to correct the noted discrepancies and to place the text thereof into proper English in accordance with 37 CFR 1.125(c). Also accompanying this amendment is a reproduction of the original specification with markings indicating the amendments effected in the substitute specification in accordance with MPEP

§608.01(q) and 37 CFR 1.125(b). Applicant notes that these amendments are made relative to the original specification prior to the amendments made thereto by the preliminary amendment filed May 15, 2002, and therefore the previous amendment to the paragraph bridging pages 7 and 8, which erroneously changed reference numeral 25 to 35, and which is now objected to, is not effected in the marked or substitute specifications submitted herewith. No new matter is added. Entry of the substitute specification and withdrawal of the objection are respectfully requested.

Claim 6 is rejected under 35 U.S.C. § 112, first paragraph, as not being enabled by the specification. Applicant herein respectfully traverses this rejection. The substitute specification submitted herewith as noted above incorporates the subject matter of original claim 6 in the disclosure, which was in the specification as originally filed, and which therefore constitutes part of the specification. As such, proper antecedent basis for claim 6 is provided by the disclosure. Moreover, the claim is adequately enabled, as the specification contains a sufficient disclosure to enable one skilled in the art to practice the invention without the exercise of undue experimentation. In this regard, tying materials of the type claimed are well known, for example, made from wound paper, and which can be dissolved when wet. The benefit of using such tying material is stated at the second full paragraph of page 3 of the originally filed English specification, i.e., to obviate removal thereof in a subsequent recycling process. Therefore, reconsideration of the rejection and allowance of the claims are earnestly solicited.

Claims 1-6 are rejected as indefinite under 35 U.S.C. § 112, second paragraph, for failing to particularly point out and distinctly claim the subject matter of the invention. The Office Action cites a lack of transitional phrase and positive recitation of elements and their interrelationship. Claims 1-6 are amended to clarify the claimed invention and to place the claims into conformance with U.S. claiming practice. The amendments were made with consideration of the various informalities noted in the Office Action. It is respectfully submitted that the amendments remove or correct the informalities noted in the Office Action. Therefore, reconsideration of the rejection of claims 1-6 and their allowance are earnestly requested.

Claims 1, 2, 4 and 5 are rejected under 35 U.S.C. § 102(b) as being anticipated by Persson (3,667,377). Applicant herein respectfully traverses these rejections.

For a rejection to be sustained under §102(b) each and every element of the claimed invention must be disclosed in the cited prior art reference. It is respectfully submitted that the cited reference fails to disclose at least the following features and elements of the present invention as noted herein.

Claim 1 recites in pertinent part the following:

a press ram movable through the filling space
into the inlet of the press channel for compressing the
loose material into a bale, said press ram including

channels communicative with outlet slots disposed in a front surface of the press ram;

knotters for tying a knot in a tying material and for cutting the tying material after the knot, the knotters being disposed next to one another at the inlet of the press channel; and

supplying arms each being disposed for movement within a respective one of the channels in the press ram, the tying material forming a loop encircling the bale which includes two opposite strands, a one of the two strands being received through a respective one of the outlet slots in the press ram and delivered to an associated one of the knotters where another of the two strands is located by operational movement of a corresponding one of the supplying arms, the two strands which are thereby brought together being knotted together and cut after the knot by the associated one of the knotters.

As such, independent claim 1 recites that tying material, which is looped around a bale, is knotted by a knotter. Applicant respectfully submits that Persson

is devoid of such teaching. Rather, Persson teaches a typical hydraulic press using wire loops which are twisted, not knotted, and then cut in a conventional manner. The reference amounts to nothing more than the press of the type described in the background section of the specification at page 2.

Claims 1, 2, 4 and 5 are amended and particularly describe and distinctly claim elements not disclosed in the cited reference. Therefore, reconsideration of the rejections of claims 1, 2, 4 and 5 and their allowance are respectfully requested.

Claims 6-9, 11-19, 22-36 and 39-44 are rejected as obvious over Persson under 35 U.S.C. §103(a). The applicant herein respectfully traverses this rejection. For a rejection under 35 U.S.C. §103(a) to be sustained, the differences between the features of the combined references and the present invention must be obvious to one skilled in the art.

Since each of the rejected claims recites that a knot is formed in tying material used to bind the bale, it is respectfully submitted that the Persson reference cannot render the rejected claims obvious because the reference does not provide the teaching noted above with respect to the anticipation rejection. Thus, the reference fails to teach or suggest all the claim limitations as properly required for establishing a *prima facie* case of obviousness. Therefore, reconsideration of the rejection of claims 6-9, 11-19, 22-36 and 39-44 and their allowance are respectfully requested.

Claims 3 and 10 are rejected as obvious over Persson in view of Tea (US 4,092,913) under 35 U.S.C. §103(a). The applicant herein respectfully traverses this rejection.

Like the primary Perssson reference, Tea teaches the exclusive use of wires and twisters, and does not teach structure for forming knots in a tying material, as claimed. The twisted ends of the wires can be readily seen in Fig. 12 of Tea.

It is respectfully submitted that the proffered combination of references cannot render the rejected claims obvious because the secondary Tea reference does not provide the teaching noted above with respect to the anticipation rejection that is absent from the primary Persson reference, i.e., knots being formed in a tying material used to bind a formed bale. Thus, the combination of prior art references fails to teach or suggest all the claim limitations. Therefore, reconsideration of the rejections of claims 3 and 10 and their allowance are respectfully requested.

Claims 20, 21, 37 and 38 are rejected as obvious over Persson in view of White (US 3,667,377) under 35 U.S.C. §103(a). The applicant herein respectfully traverses this rejection.

It is respectfully submitted that a *prima facie* case of obviousness has not been established in the rejection of claims 20, 21, 37 and 38. "To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to

combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on the applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)." MPEP §706.02(j) "Contents of a 35 U.S.C. §103 Rejection".

The secondary White reference is directed to a harvesting press working with a knotter, while the primary Persson reference discloses a stationary hydraulic press using wires and twisters. Consequently, the proffered combination of references lacks the motivation to combine, as well as the reasonable likelihood of success. For example, in this regard, the Office Action fails to indicate how technology applied specifically to a harvesting press which utilizes a knotter, in White, is to be adapted to the structure of Persson specifically designed to tie wire by a twisting operation. Applicant respectfully submits that one of ordinary skill in the art would not receive the requisite guidance necessary to arrive at the claimed invention simply based upon the two cited references viewed without benefit of the instant disclosure. It is improper as a matter of law to use the claims presented as a blueprint to combine prior art references. *Ashland oil, Inc. v. Delta Resins & Refractories, Inc.*, 227 USPQ 657, 667 (CAFC 1985). To imbue one of ordinary skill in the art with knowledge of the invention, when no prior art reference or references of record

convey or suggest that knowledge is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher. See *W.L. Gore and Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983).

Thus, it is respectfully submitted that the rejected claims are not obvious in view of the cited reference(s) for the reasons stated above. Reconsideration of the rejections of claims 20, 21, 37 and 38 and their allowance are respectfully requested.

Claims 45-50 are added and are submitted as patentable over the cited art of record insofar as they recite features which are not believed disclosed in the cited art in the manner as claimed.

Five (6) further claims in excess of twenty are added. Two (2) further independent claims in excess of three are added. Accordingly, please charge the fee of \$280 to Deposit Account No. 10-1250. Please charge any deficiency or credit any overpayment to Deposit Account No. 10-1250.

Applicant respectfully requests a one (1) month extension of time for responding to the Office Action. Please charge the fee of \$110 for the extension of time to Deposit Account No. 10-1250.

In light of the foregoing, the application is now believed to be in proper form for allowance of all claims and notice to that effect is earnestly solicited. Please charge any deficiency or credit any overpayment to Deposit Account No. 10-1250.

Respectfully submitted,
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enc: Substitute Specification; and Marked reproduction of original specification.

BALE PRESS FOR LOOSE MATERIAL

BACKGROUND OF THE INVENTION[[:]]

Bale presses have long been known and tested in the field of harvesting
 5 machines. For these presses, stalk material, which is to be pressed, is transferred
 over conveying paths and by conveying means into a filling space and stuffed
 there with a pivoted press ram into a baling space. The baling space is a provider
 with tying devices, with the help of which the material pressed is tied up into
 bales. The course of these processes proceeds with mechanical coupling, the
 10 driving mechanism starting out from a central drive shaft.

In addition, there have already been attempts to use systems, which have
 been tested by harvesting machine, also for stationary presses, such as those for
 waste paper. This use accommodates, especially, also the tying technique with
 tape knotters, which was developed for harvesting machines and manufactured on
 15 a large scale. In this case, the tape is no longer brought together through the stalk
 material to the knotter, as is customary with harvesting machines with stalk
 material that can be pierced well, but must be inserted by the piston, avoiding the
 material being pressed. This is not a problem in the case of a small and light

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construction and a piston with wide openings and low working forces, as in the case of harvesting machines.

On the other hand, waste presses for industrial requirements are stationary and work with very high forces and are to be designed for breakdown-free,
5 continuous operation. At the same time, wire ties are generally provided, for which thick wires are uncoiled from rolls and, during the completion of a bale and optionally also at the start of a new bale, are connected to one another by twisting.

However, it has turned out that the wire material interferes with the further processing of the material which has been compressed and, moreover, requires
10 expensive and critical working steps for its elimination. For example, during the comminution or wet processing of waste paper, cut wire residues can stop or even damage the processing machines. Already during the transport and storage of the bales, protruding, twisted and terminally cut wire ends interfere and are hazardous.

SUMMARY OF THE INVENTION[[:]]

Pursuant to the invention, the knot technique can also be used for large industrial presses with a high output. In this connection, it is very important to construct the openings in the press ram in the form of tailor-made channels which, on the one hand, do not form any dead corners and regions, into which the material being pressed can penetrate and, instead, are "swept" by the supplying arms of the knotters and, on the other hand, with outlet slots at the front for the tying material, enable the die to be retracted after the binding and nevertheless, in contrast to the wide open regions, customary with conventional bale presses working at a low pressure and a low output level, make provisions so that the openings reduce to slots and, with that, are secured as far as possible against penetration of material being pressed and that also the high compression forces are applied with a press ram surface which remains as large as possible.

With that, the knotter technique can also be used with flexible tapes for large presses. It has turned out that these tapes are not in any way inferior in strength, as was previously assumed, to the wire ties. A critical testing in this respect has shown that wire ties, due to the strength of the wire, can absorb high loads. However, the twists represent weaknesses with a much lower load-

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carrying capacity and represent a need for safety reserves, with which very limited values result. In the case of flexible tying material and a knotting technique, very high strengths can be realized for the tying material as well as at the knot, these results being obtained with little sacrifice of safety. As far as the strength of the girding is concerned, a pressing need for the use of wire girding can no longer be maintained.

A large number of non-metallic fibers of textile or plastic materials, which satisfy the requirements that must be fulfilled here, are available on the market as tying material. Especially for girding waste paper bales, there are even tying materials, which cannot be undone but dissolve when wet, or even tying materials with a fine and short form (i.e., without strong and long fibers, which can therefore be dissolved when wet) for recycling or tying materials on a paper basis, which do not have to be removed in a subsequent recycling process and, instead, can be used as starting material for the recycled product.

Such a bale press can then be operated in the manner already customary with large hydraulic presses with wire ties in a sequential sequence of pressure medium-actuated movements, for which the knoter function is initiated only at the conclusion of a pressing and lifting motion of the press ram, which completes

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a bale, and the supplying arm passes through the press ram only when the latter is stationary. With that, additional opening spaces in the piston can be avoided, which would otherwise be necessary for mechanically coupled and mutually overlapping motions of the ram and supplying arm of agricultural machines.

5 For the tape loops, which are to be provided for girding a bale, basically a single knot per tape loop is required, so that the tape loop consists altogether only of a one-piece section of tape. This technique has the advantage that only one knot has to be produced, so that, when the knot is specified with a residual uncertainty with respect to its durability, only one uncertainty place remains.

10 However, this technique had the disadvantage that after the knotting and cutting, the free end of the tying material must be held at the knotter for the subsequent bale and, when forming and pushing in a new bale, the tape must be shifted gradually at the periphery of the bale in accordance with the growth of the latter. This leads to large movement of the tape relative to the bale and also to critical
15 loads.

In accordance with an alternative tying technique, the tying material is pulled off in two strands from two mutually opposite rolls of similar supplies and the knotter produces a knot before and after each cut. One of these knots closes

the girding for the finished bale and the other connects the two new open strands into a loop. This loop and the two strands can run along with the bale as it grows without any shifting relative to the bale worth mentioning.

5 An example of the invention is described in greater details in the following and shown in the accompanying drawings.

BRIEF DESCRIPTION OF [[IN]] THE DRAWINGS[[:]]

Figure 1 [[shows]] is a vertical section through a channel track press in accordance with an embodiment of the invention[[:]]; and

10 Figures 2 to 7 [[show]] are horizontal sections through the channel press of Figure 1 for different situations of the tying process.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS[[:]]

The channel bale press, which is labeled 1 as a whole in the drawing, is shown in each case only in a central region with a portion of a filling shaft 2 over a filling space 3 below and the adjoining part of a press channel 4, a press ram 5

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with an associated piston 6 of a hydraulic actuator being in the advanced position in the filling space 3 and in the inlet of the press channel 4, where it holds a finished but not yet tied bale 7 under compression, while a previously finished and already tied bale 8 is in the press channel 4 as "abutment" for the bale 7. The
5 construction, described up to now, corresponds to conventional industrial bale presses with hydraulic driving devices and an unwinding technique based on wire windings.

In the present case, however, the bales are held with a tape-shaped flexible tying material, so that the textile bales 8 are fixed with three girdings 9, which lie
10 on top of one another, while the bales are not yet tied but are already bordered on three sides by three open tape loops 10.

For closing these tape loops, in each case, one of two strands of the tying material on either side is passed through the press ram to the other strand. For this purpose, the press ram has channels 11, which extend horizontally here to fit
15 in with the horizontal tying. It is self evident that the alternatively possible vertical tying would lead to vertical channels. The channels are fitted tightly to the space required by three supplying arms 12 and, in a front press ram surface

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13, end in slots 14, which offer the smallest possible width for the entry of material, which is being compressed, into the press ram 5.

As is evident from the horizontal sections of Figures 2 to 7, the depth of the respective channel is also adapted to the movement profile of the supplying arm 12, in order to avoid "dead corners", in which compressed material can otherwise easily be deposited and consolidated at high loads and during continuous operation and, with time, easily lead to operational malfunctions, which are also difficult to deal with. The channel 11 accordingly is determined by the supplying arm 12, which moves back and forth through the channel 11, carrying out a circular motion about an axis 15. At the same time, penetrating material, such as leaf-shaped paper, is pushed out to the one side or the other. In this respect, the [[press]] channel 11 still has a terminal expansion 16 relative to the circular contour, in order to facilitate ejection of the pressed material from this region.

The supplying arm 12 has a sickle shape, with which it can be moved largely in the longitudinal direction through the channel 11. It is actuated over a two-arm lever 17 by ~~a~~ from a hydraulic pressure medium-driving mechanism 18 outside of the [[press]] channel 11.

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The tape is supplied to the press channel 4 from two sides and, moreover, in each case from one of two rolls 20, 21 over one of two adjustable friction guides 22, 23 as yarn brakes for maintaining a yarn tension by friction, which then run together over elastic guides 24, 25 and suitable deflections on the one
5 hand through a guide 26 of the supplying arm 12 and, on the other hand, through a knotter 27 about the new bale 7 up to a knot 28 to form a loop. ~~An adjacent knot 26~~ An adjacent knot 29 at the already finished bale 8, in conjunction with the rolls 20 and 21, which are present in duplicate as a supply of tying material, shows that two knots per cut, one on each side, must be produced, in order to
10 ensure that the tape can be supplied easily on both sides.

The idle position of the knotter 27 and the supplying arm 12, shown in Figure 2, normally is maintained during several compressing lifts of the press ram
5 which, with every lift of the die, adds to a partial bale until a complete bale having a specified minimum length is obtained. At the same time, the tape loop
15 30, closed at the knot 28, moves according to the completion of the bale 7 as far as the starting position for knotting, which is shown.

Figure 3 then shows how the supplying arm 12 with a strand 31 of the tape loop 30, which lies on the outlet side of the supplying arm 12, is ~~swiveled~~

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swivelled through the piston 5 and, at the same time, has brought together this strand 31 in the region of the knotter 27 with an opposite strand 32 of the tape loop 30. With a rotating and pulling-through motion of the knotter, the loop 30 is closed in the form of a knot 33 and severed from the supply rolls 20 and 21
5 behind the knot, the ends of the tying material being held together and also knotted (Figure 5), before the supplying arm 12 returns to its starting position (Figure 7). The new loop 34, which is held by the new knot ~~[[25]]~~ 35, is held tightly by the elastic guides 24 and 25 as the supplying arm 12 is retracted.

The structure of the knotter and the knotting process do not have to be
10 discussed completely in detail, since a basic technique is involved here, which has been known and tested in different variations for a long time, especially in the area of harvesting machines. In harvesting machines, there is a central continuous driving mechanism, which moves the participating functioning elements in tight, rigid coupling with one another. It is essential for the actuation of different
15 driving mechanisms, for which provisions are made here, that it is possible to achieve as reliable a driving mechanism as possible even at high pressures and for material, the compressing properties of which are critical, it being possible to coordinate the starting times and duration of the different courses of motion separately.

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As shown by means of Figure 4, the two strands 31 and 32 are to be nestled closely together in a region in which the new knot ~~[[32]]~~ 35 is to be formed. For this purpose, a yarn presser 36, which initially appears in cross view in Figure 2, swivels about an axis, which extends parallel to the plane of the drawing, and shifts the adjacent end of the strand 31 to the strand 32. However, this contacting movement does not take place in the temporal interplay with the movement of the supplying arm 12 as it does in the case of one of the coupled movements of harvesting machines. Instead, it takes place at a later time. What matters is that the supplying arm 12 as it moves forward through the channel 11, ejects all foreign material that may have entered the channel 11 and also reaches its end position, before the knotting with the contacting movement of the ~~contactor~~ yarn presser 36 is initiated.

The exceedingly complex but known and fully developed movements in the knotter 27 are brought about by a control disk 37 with suitable control cams, which act on a knotter mechanism 38 (not shown in detail), which is provided with appropriate fingers. As a result of these movements, the two strands on the supplying side of the tying yarn are taken hold of and held together, cut off up to the knot region and knotted with one another there.

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In order to close the free ends of the end yarn, which initially are held together unknotted in the knotter 27, into a new loop, in which these are connected by the second knot ~~[[32]]~~ 35, the supplying arm 12 initially creates the free movement space of Figure 6, in that it returns out of the piston 5 into its

5 starting position. For knotting, not only the cut ends of the tying material but also the adjoining regions must be brought closer together, in order to have the tying material approximately parallel for the knotting. For this purpose, a tape rocker 39 at the knotter 27 moves so that the yarn strand, unrolling from roll 21, is pressed with the help of a contacting roller 40 against the yarn strand unrolling

10 from the roll. At the same time, the yarn presser 36 is ~~swiveled~~ swivelled along once again with the yarn rocker 39 for the second knot, in order to bring the two ends of the tying yarn together. These movements also are specified independently of time and in a sequence, which is directed to the reliability of the knotting. For this purpose, the yarn rocker 39 is ~~swiveled~~ swivelled by an

15 actuator 41, operated by a pressure medium, after the supplying arm 12 has concluded its movement. The later is also actuated independently and moreover the pressure medium actuating drive 18.

An operation with hydraulic actuators is advantageous for converting the harvesting machine tying technique. In this respect, it is advantageous for the

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coordination and the adaptation of the exceedingly critical press ram region, if the press ram remains stationary and does not carry out a continuous movement about its front dead center, when the supplying arm goes to the knotter, as is customary in the case of harvesting machines. A careful coordination of the piston openings
5 with the movement profile of the supplying arm can be achieved here. At high outputs and high compression forces, it is also important to ensure that the piston remains stationary in its front end position and, at the same time, keeps the finished bale under pressure and does not return back over its dead center position already during the tying process.

10 However, it has been observed that this technique can be used advantageously in the area of industrial, heavy and stationary hopper bale presses and especially in channel bale presses, if the requirements of the material being pressed, such as waste paper, can take into account the high press forces and the continuous operations by a special configuration of the binding region.